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## Worldwide Report

# TELECOMMUNICATIONS POLICY, RESEARCH, AND DEVELOPMENT

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13 MAY 1986

WORLDWIDE REPORT  
TELECOMMUNICATIONS POLICY, RESEARCH AND DEVELOPMENT

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PEOPLE'S REPUBLIC OF CHINA

SIMULATION MODELS OF TELEPHONE SWITCHING SYSTEM

Beijing TONGXIN XUEBAO [JOURNAL OF CHINA INSTITUTE OF COMMUNICATIONS] in Chinese Vol 6 No 2, Apr 85 pp 89-92

[Article by Han Huijun [7281 1979 0689], Liu Yunhe [0491 0061 7729], and Yang Zhengwei [2799 1767 0251]: "A Method for Constructing the Simulation Models of a Telephone Switching System"]

[Text] Abstract: A basic method is presented for establishing simulation models of a telephone switching system by using the GPSS-F simulation language. A rotary line switching system is selected as an example. The results are consistent with those in practice. It is shown that this can be used widely.

As China's telephone communications networks have developed quickly, it is obviously completely necessary to study a computer simulation model that establishes a telephone switching system or telephone network, because it can quickly analyze and compare programs, and consequently can effectively use funds and equipment.

In recent years, there have been several simulation program packages abroad especially for simulation of telephone networks, and in this country, too, there are some units that have done work in this field, which is a necessary trend in the development of telephone communications service in this country.

The simulation model established in this paper is for an exchange of primarily rotary systems, and which has an installed capacity of 14,000 circuits (5,000 of which are actually open). Under this exchange are two branch exchanges, A and B, where the capacity of A is 10,000 circuits and that of B, 4,000. The goal of simulating this telephone exchange system is to find the rate of call connections, the rate of use for all equipment, and average waiting time, all under conditions of various volumes of subscriber telephone service. The simulation model uses the GPSS-F simulation language (which simulation language we have ported to the Burroughs 1955 computer). For functions and structure of this language, see documents [1] and [3]. Below, we have explained the set-up method of this simulation model for each of the three problems.

## I. The Basic Composition of Telephone Switching Systems

The main components of the telephone switching system are: the cord circuit, the register, and 1st, 2d, and 3d group selectors, as well as the final selector (see figure 1), and as one can see from the diagram, this is actually a single line, single service queue system that transverses multiple levels of selection.

A queued system is largely made up of the three parts that are the input system, queuing rules, and the service process, and we discuss these components below.

### A. The Source of the Call and Probability of Distribution

Under conditions of actual telephone service volumes, we can divide call sources into five kinds. Source 1 is used to simulate initial calls; source 2 simulates the incoming calls; while calls at this local exchange are divided into sources 3, 4, and 5 according to their degree of activity. The probability distributions for the intervals between times of arrival are all negative indexes, differing only by average values (see table one).

In addition, because this simulation model is based on calls within the area of the local exchange, the probability of calls within the exchange and of calls outside the exchange must be determined according to actual call conditions. For this simulation model that has been chosen as 0.73 and 0.27, respectively.

### B. Queuing Rules

source number	2	3	4	5
average value for arrival time interval (in 1/100 seconds)	19.388	85.125	11.95	350.813

Call handling is generally in accordance with the principle of "first in, first out." If the equipment is not available, then the call must wait, and the longer the waiting time, then the longer the delays in putting through the call. The general rule is that if the delay exceeds 30 seconds, the call is considered lost. This model is primarily to study the loss created by the subscriber being busy, and has not yet taken into account loss created by equipment being busy.

### C. The Probability Distribution of Call Times

Calling times also use a negative index for probability distribution and are based on actual conditions, the average values for which range from 80 to 100 seconds.

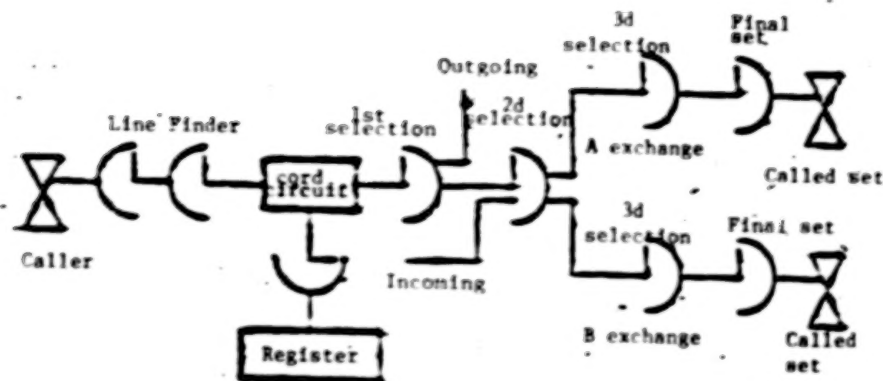


Figure 1 Basic Composition of Switching System

where: Cord circuits, 500 circuits; registers, 100 circuits  
 second selector: Incoming, 500 circuits, local exchange, 500 circuits  
 third selector: Exchange A has 5 levels, each level having 135, 135, 135, 150, and 135 circuits. Exchange B has 2 levels, each level having 135 and 150 circuits, respectively.  
 final set: Exchange A, 50 levels, each level 16 circuits; exchange B, 20 levels, each level 16 circuits.

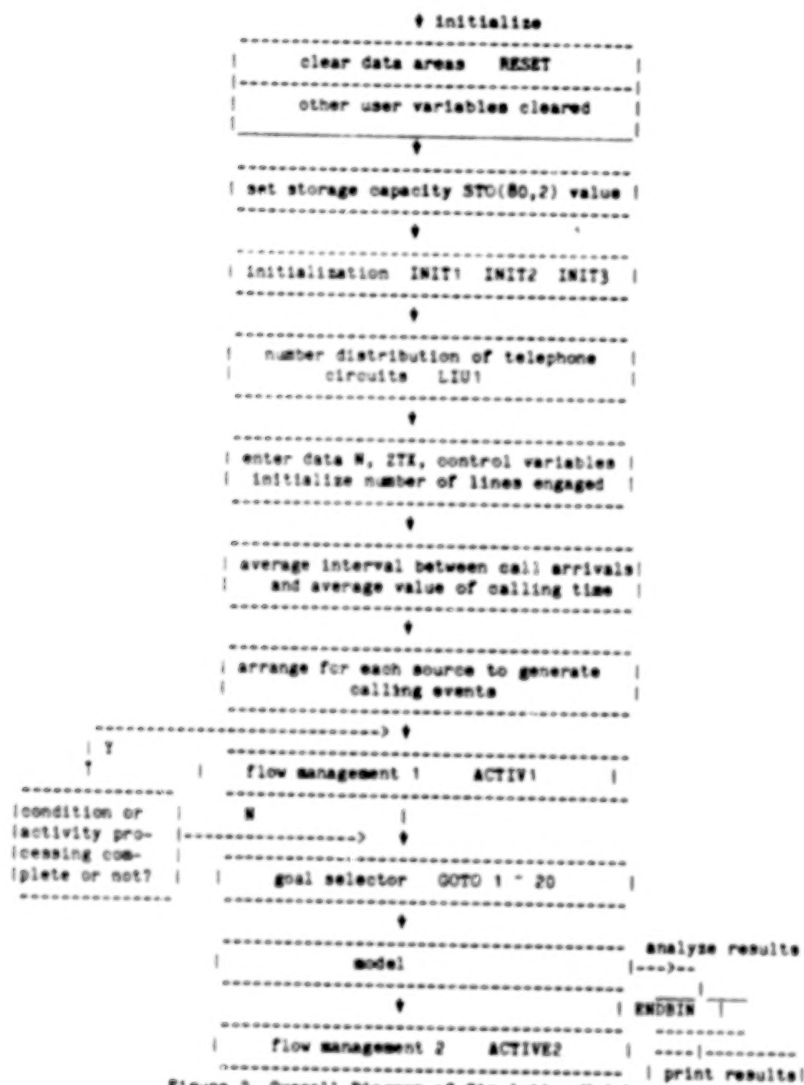


Figure 2 Overall Diagram of Simulation Model

# Table of Simulation Results

Connection Rate = 0.85253453

Average waiting time before each call is connected (after dialing) = 44.35586  
hundredths of a second

	equipment utilization rate	average waiting time
1 (cord circuit)	.28945761	.00000000
2 (register)	.22595363	.00000000
3 (2nd select. [local exchange])	.28945761	.00000000
4 (3d sel.[exch. A] each position)	.73818594	4.37036991
5 (same)	.70195645	.22975516
6 (same)	.38466852	.00000000
7 (same)	.00000000	.00000000
8 (same)	.00000000	.00000000
9 (3d sel [exch. B] each position)	.86546480	47.92132568
10 (same)	.00000000	.00000000
11 final set (exch. A) each pos.	.67071813	64.36923217
12 (same)	.70653182	192.00000000
13 (same)	.47260278	.00000000
14 (same)	.59255796	.50000000
15 (same)	.81811100	113.65625000
16 (same)	.42795747	.00000000
17 (same)	.59482705	.00000000
18 (same)	.50609630	.00000000
19 (same)	.69703829	78.11428833
20 (same)	.51539617	.00000000
21 (same)	.49642819	.00000000
22 (same)	.56662523	39.38461303
23 (same)	.64484280	54.40322875
24 (same)	.64331662	69.22222900
25 (same)	.41729956	.00000000
26 (same)	.32335585	.00000000
27 (same)	.48402911	.00000000
28 (same)	.73568940	128.24137878
29 (same)	.74331033	123.56944274
30 (same)	.67614603	.00000000
31 (same)	.37897199	.00000000
32 (same)	.36907821	.00000000
33 (same)	.21964824	.00000000
34 (same)	.26565158	.00000000
35 (same)	.34117865	.00000000
36 (same)	.36377376	.00000000
37 (same)	.33758133	.00000000
38 (same)	.32456278	.00000000
39 (same)	.31688278	.00000000
40 (same)	.32831126	.00000000
41 (not open)		
62 (not open)		
63 (final set [exch. B] each pos.	.63476175	43.25862121
64 (same)	.76423609	44.01538085
65 (same)	.55598646	11.50877189
66 (same)	.61742645	60.75509643
67 (same)	.78113931	239.34848022
68 (same)	.72822439	42.22950744
69 (same)	.67507112	.00000000
70 (same)	.59938013	.00000000
71 (not open)		
80 (not open)		
81 (2nd set [incoming])	.55458074	.00000000



## II. The Computer Simulation Model

### A. Simulation of Call Flow Over a Given Distribution

If one wants to know the calls according to changes in the negative index probability distribution, that can be done by calling the two modules "ERLANG" and "GENERA."

### B. Simulation Initialization

When the simulation begins, it is generally necessary to reset each initial state to reduce the time in which to reach statistical equilibrium; that is, prepare a certain value for the number of calls to handle. For the timing of calls, one may use uniform distribution random numbers for the simulation, where we used random numbers of uniform distribution from 0.2 to 120 seconds to initialize calling times. Because some calls will be near completion and others will have just begun, we have used uniform random numbers within a broad range.

Also, to simulate the actual conditions of telephony, we also had to number the subscriber telephone lines. There are 500 lines in source 3, 405 lines in source 4, and 450 lines in source 5. This function is performed by subroutine LIU1, in which the number of occupied lines in exchanges A and B are 0.65 and 0.35, respectively.

### C. The Handling of Call Flows and Data Recording

This portion include three processes: one, finding the subscriber line, i.e., selecting the numbers calling and being called; two, selecting the line, i.e., searching for lines with available equipment; three, the process of putting through the call.

#### 1. Finding the Subscriber Line

After each originating call has arrived, we first use a uniform distribution random number to select an originating caller number, and at the same time determine whether this subscriber line is occupied. If it is in use, then another selection must be made. Then, based on the given probability, we determine the called line of either exchange A or B, and determine from which source it comes.

#### 2. Selecting the Line

We use memory location STO(I,2) to indicate cord circuit and the various levels of register group selector. Before entering any storage location, it must first be determined whether there is an available storage unit, which is done through the two modules, "GATE2" and the flow management 2 [sic] "ACTIV2."

### 3. The Process of Connecting the Call

Calling times vary according to the negative index probability distribution, the average value for calling time being 80 seconds. The call completion process is accomplished by the "ADVANC" module, and the number of calls in a calling state and other statistical data are recorded by the two subroutines, LIU3 and LIU4.

Figure 2 is an overall diagram of the computer simulation program.

### III. The Results of Simulation

Data necessary for input while this system simulation is running are: average values for simulation time, initial values, equipment capacity, intervals between call arrival times, and calling times. Because of this, if we want to study the effects on this simulation when conditions change, all we need to do is to change the relevant data.

Simulation results are primarily in the following areas: connection rate; average waiting time for calls; rate of equipment use; average waiting time for calls before all equipment.

For results of our simulation, see appendix.

We have simulated many different times, and what is listed in the appendix are the results in each category from simulations of 5 minutes.

From the point of view of equipment utilization, it is low overall, with some values being zero; but the completion rate of 0.85 is higher than actual values. We explain the reasons below:

1. The capacity of the equipment on this switching system is based on 10,000 installed telephones (installed capacity of 14,000), and in current simulations we reduce the number of subscriber lines by one-half, so the utilization rate is greatly decreased, to the extent that some levels are not even used.

2. We have used a calling time of 80 seconds, which should actually be somewhat longer (generally about 120 seconds), so this increases the rate of completion. Because extending the calling time will cause an increase in the number of calls within the system and the fact that we have been limited by the array unit size of the type of computer we are using, we have thus chosen a smaller value for the calling times.

3. We have undertaken simulation at 1, 3, and 5 minute simulation times, and it can be seen from the results that the equipment utilization rate continues to increase as simulation times increase, while the completion rate constantly decreases. This is because the simulation process is actually a large volume sampling and testing process. As the sampling times increase, the average values will generally approach true values. What we have chosen is a method of single, long-term simulation operations, but because of limitations in the type of computer we are using, we have not yet reached a state of complete

stability in the random process. But from the trends in changes, the rules can already be seen.

By applying the simulation model modeling method provided in this paper, various schemes can be analyzed and compared, which should have great practical significance for designers and operating personnel.

#### REFERENCES

1. B. Schmidt, GPSS-FORTRAN, John Wiley & Sons, New York, 1980.
2. Geoffrey Gordon, System Simulation, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1978, pp. 197-238.
3. Han Huijun, Xie Jianying [6200 0494 5391], and Chen Yinglin [7115 2019 7792], "Applications of the GPSS-F Simulation Language in Simulations of Discrete Random Systems," INFORMATION AND CONTROLS in Chinese 1983.4 (manuscript received 26 September 1983).

12586  
CSO: 5500/4153

BRAZIL

AUTOMATION, COMPUTER SECTOR PLAN APPROVED

PY181758 Brasilia Radio Nacional da Amazonia Network in Portuguese 1000 GMT  
18 Apr 86

[Text] Brazil will not give in to pressure to change or reorient its computer sector policy. This statement was made by President Jose Sarney on 17 April, when he approved the national plan for the automation and computer sector. Sarney said that both as a citizen and as a politician, he will continue to support the plan.

[Begin Sarney recording] On this important occasion, I will reiterate something I have already stated before: I feel personally committed to the national computer sector policy. This plan has set the operational guidelines for the computer sector law. I participated in designing this policy and, now that I am the president, I cannot give in to pressures to change it or reorient it along a line that is contrary to Brazilian interests. [end recording]

The president added that the computer field is essential for all sectors.

/9738

CSO: 5500/2038

13 May 1986

BRAZIL

SENATE LEADER DEFENDS INFORMATICS LAW

PY242344 Brasilia Domestic Service in Portuguese 2200 GMT 23 Apr 86

[Text] Senate First Secretary Eneas Farias has defended the Brazilian Informatics Law and condemned continuous U.S. pressure against it. Senator Eneas Farias was referring to a letter sent to Itamaraty by U.S. Secretary of State George Shultz in which the U.S. Government asked Brazil to adopt a more flexible policy in the computer sector. In the opinion of Eneas Farias, it is useless to try to pressure Brazil on that subject, because both the government and the individual politicians are determined to defend the country's sovereignty.

The senator from Parana State recalled that President Jose Sarney has already stated that the informatics Law will not be changed. After congratulating the president for taking that position, Eneas Farias said that technology is the only means for Brazil to attain international competitiveness without enslaving its people and without alienating its resources. He added that in defending the Informatics Law, the objective is to protect Brazilian industry against U.S. attacks, and expressed his fear that the pressure now exerted against the computer sector might later be exerted against other sectors of the economy.

/12858

CSO: 5500/2040

BRAZIL

USSR TO SIGN PURCHASE CONTRACT FOR OPTICAL FIBER CABLE

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 1 Apr 86 p 34

[Text] An agreement should be signed soon between the Brazilian and Soviet governments for the sale of 1,500 kilometers of optical fiber cable, over a 4-year period; this will mark the return of TELEBRAS [Brazilian Telecommunications, Inc.] to the Soviet Union to participate in the Fourth International Communications Fair, on 27 May. The contract, which is in the process of negotiation, is the fruit of the First Individual Brazilian Exhibition, held in the USSR in October, when the latest advances were demonstrated in telecommunications and computer technology.

The contract provides for the immediate sale--by ABC X-Tal, a Brazilian firm which manufactures optical fibers--of 56 kilometers of underwater fiber optic cable to the Soviet Government, with the first 400-kilometer lot to be delivered during the next 2 years. The agreement was negotiated by technicians of the East European Commission of the Foreign Affairs Ministry and also involves other socialist countries which took part in the industrial fair in 1985, all of which are members of COMECON [CEMA], the organism responsible for negotiations between the socialist bloc and members of the EEC and Western nations.

According to TELEBRAS technicians, the countries are most interested in the "holding company" which directs 29 Brazilian telecommunications firms, providing all the states with optical fibers; micrometric fibers as fine as a hair, they are strong enough to substitute for the copper wire, hundreds of times thicker, used in telephone cables, and provide greater reliability and better quality of transmission.

According to the TELEBRAS technicians involved with the International Communications Fair, Brazil's participation in the exposition which the Soviet Government is promoting could produce much better results than have been achieved to date. "This event carries greater commercial weight," one of them explained, recalling that the first exposition, last October, served to "open the door" to this great market which is emerging in Eastern Europe.

The telecommunications and computer sectors should grab a good part of the \$2 billion which the Soviet Union tends to invest this year, as part of its 5-year plan (a kind of national development plan), in the automation

of its offices, by which the Soviet Government aims to speed up the wheels of the Soviet bureaucracy. To this end, in addition to the computers which the Brazilian manufacturers will export, the Soviet Union also needs to acquire related equipment to set up the public data communications network.

6362

CSO: 3342/90

JAMAICA

TELECOMMUNICATIONS ADVANCES, PROSPECTS DISCUSSED

Kingston THE DAILY GLEANER in English 7 Apr 86 pp 1, 3

[Text]

Deputy Prime Minister Hugh Shearer has predicted that this island stands to gain substantial economic benefits from the "very significant amount of interest being shown in Jamaica as a location for off-shore data-handling."

He suggested that the country should "put ourselves in a position to take advantage of the opportunity."

Addressing the 15th anniversary dinner and long service awards presentation of Jamintel, at the Oceana Hotel on Saturday night, Mr. Shearer said:

"There is already a very significant amount of interest being shown in Jamaica as a location for off-shore data-handling which is made technically possible through the linkage of computers and satellite transmission, and which is viable because of our closeness to North America." He then went on to declare: "All the indications are that the economic benefits to us could be substantial: we must therefore put ourselves in a position to take advantage of the opportunity."

Mr. Shearer said that the potential for new employment, new export earnings and for new business was too great to be ignored.

He praised the company for having fulfilled its obligations well over the 15 years of its existence and for having steadily expanded its facilities so as to maintain the services for which it was given responsibility as well as for showing a readiness to adapt to new technology.

The Deputy Prime Minister said that it was important for people to recognize the importance of the impact on the society of the growth in telecommunication and the accompanying vast mobility in information and ideas.

"I believe that it is important for us to recognize the impact that this must have on the society...it sets a faster pace that we must keep up with; it exposes us to new information and new ideas at a rapid rate and it is inevitable that this will affect attitudes and reactions to events."

"What I suggest is important to recognise is that this increasing mobility and rapidity of information and ideas will inevitably affect attitudes all over the world...it will affect the attitudes of everyone whether or not he has direct access to a telex, facsimile machine or a dish..."

Giving a 15 year review, Jamintel's General Manager, Mr. Trevor Minott, said that the financial performance of the company has been commendable: other than the capital cost of the planned developments at the start of the company's life which was covered by loan funds, all developments undertaken since then have been financed from internally generated funds.

"We have never been a charge on the public purse," Mr. Minott said.



Revenue in 1971/72 was just over four million dollars with a profit after tax of J\$156,000 and now at the end of the company's 15th year the revenue was an estimated J\$110 million with profit after tax of J\$28 million.

He said that this was the kind of performance that had enabled the company to pay annual dividends and finance the capital development programme every year from its own resources.

He attributed the increase in revenues over the years to growth stimulated by high quality circuits and service. The records show that Cablegram rates have not been increased since 1969 and International telephone rates were increased twice in 1979 and 1984 and telex rates once in 1979.

During 1973 an Automatic Telex Exchange designed by the Company's technical staff was brought into operation and by July of this year that exchange will be replaced with a state-of-the-art International Telex Exchange at the cost of J\$13 million.

Today, the company provides 450 international telephone circuits, 104 international telex circuit and over 60 private leased circuits of all types to link Jamaica with the rest of the world.

The Memorandum of Agreement between the Government and Cable and Wireless called for the repayment by Government to C&W of a percentage of its dividend to purchase the Government's 51% shareholding in the Company. Because of the company's ability to pay its shareholders a dividend each year the full amount has now been paid, he said.

Fifteen members of staff received awards for ten and 20 years' service.

Jamtel's Chairman, the Hon. Horace Barber; Sir Fred Phillips, Chief Legal Adviser (Caribbean Area), Cable and Wireless PLC; and Mr. Douglas Buck, member of the Board of Directors, Jamtel, were honoured for their years of service on the Board.

/9317

CSO: 5540/060

JAMAICA

DIGITAL MULTIPLEX SYSTEM SPURS INVESTMENT HOPES

Kingston THE DAILY GLEANER in English 7 Apr 85 pp 1, 3

[Text]

**A \$6.8 MILLION MODERN TELEPHONE service to St. Thomas, which was cut into the national system on Saturday, is part of a \$14 million programme to put the parish in a position to attract investment.**

This was disclosed by Minister of Public Utilities and Transport, the Hon. Parnell Charles, who also said that a \$7 million expansion project, "involving the running of high-tension cable for electricity supply from Annotto Bay to Lyssons, should soon be completed.

This new development, Mr. Charles said, would lessen the amount of power outages in St. Thomas caused by trees falling on cables from Kingston.

Mr. Charles, who was speaking at the cut-over ceremony for the digital multi-complex switching system for Morant Bay and surrounding areas at the Jamaica Telephone Company's exchange in the town, also announced that a \$200,000 farm roads improvement programme would start next month in his Eastern St. Thomas constituency.

Experts were examining the possibility of installing a modern pumping system to service the 250,000 gallon-capacity water tank in the capital, he said.

These initiatives, along with the increase from 340 to 600 lines under the new digital system, were aimed at putting St. Thomas "on the road to real economic development" with its proximity to Kingston's sea and air ports.

"St. Thomas has been almost on the back-burner of development for years," he said, and to date had had little development.

Yallahs will have experiment with "telephone radio" under the new digital system. The Jamaica Broadcasting Corporation could now be heard on a new frequency and the new building to house Channel 11 would soon be completed, Mr. Charles said.

"The development of St. Thomas, which has been held back for years, will now move forward," he declared.

Giving details of the digital system, the features of which were the first to be installed in the island, Mr. Charles said customers could now programme their telephone so that incoming calls could be routed to another number if they were neither at home nor in office.

"If a customer should call your number while the line is engaged, a short burst of music will be transmitted to you, indicating that a call is waiting. You can then place the first party on 'hold' and speak to the second party or alternate between both parties," he said.

The telephone company can also have a recorded announcement connected to a line to remind that customer that there is an outstanding bill and that the line has been disconnected for non payment.

The new system, supplied by Northern Telecom of Canada, would be maintained by remote control from Carlton Exchange in Kingston. However, Mr. Charles gave the assurance that no staff would be made redundant as the company would absorb their skills elsewhere.

Such areas as Bath, Style Hut, Airy Castle, Stokes Hall, Duckenfield, Hampton Court and Manchioneal, among others, will benefit from the cut-over.

Mr. Charles appealed to residents to protect the company's equipment against vandalism as it was costing the country huge sums to instal the new systems.

He made an inaugural call with the use of 'touch' dialling to New York at the home of retired City College Professor, Ms. Martha Farmer. She told the audience, over the amplified telephone, that Mr. Charles was a "most outstanding" student at City College.

"You will certainly become Prime Minister of Jamaica and when you do I'll be there to see you inaugurated. You're a most outstanding statesman," Professor Farmer said.

/9317

CSO: 5540/060

INDIA

SATELLITES SAID TO FUNCTION WELL, PLANS REVEALED

Bombay THE TIMES OF INDIA in English 7 Apr 86 p 12

[Text] Bangalore, April 6--The fabrication of INSAT-1C (Indian National Satellite 1-C) is nearing completion and the "acceptance test" for the satellite would be conducted during this month. The satellite is to be launched in September this year.

The launching of the satellite by the Space Transportation System (STS) of NASA of the U.S. was originally scheduled for the mid-1986 but it had to be postponed following the recent setback in the U.S. space shuttle.

According to the space department, the work on INSAT-1C, an on-orbit spare for the INSAT-1B now in space, was progressing satisfactorily and the acceptance test would be completed well ahead of the spacecraft availability requirement for its launch.

An Indian payload specialist would fly on board the shuttle carrying the INSAT-1C. Two ISRO scientists have already been selected and both the scientists have passed the NASA medical tests. The space department has also exercised its option to fly another payload specialist on STS carrying the next satellite, INSAT-1D.

INSAT-1D

The space department ordered the INSAT-1D with the Ford Aerospace and Communications Corporation of USA, the suppliers of the earlier INSAT-1 spacecraft, following the failure of the INSAT-1A. The work on INSAT-1D commenced in October last year and was progressing as scheduled.

Though basically the satellite would be similar to its predecessors of the INSAT series, INSAT-1D would have certain improved features like larger battery capacity to support a larger payload operation. The spacecraft is expected to be ready in the mid-1988.

Meanwhile, INSAT-1B has completed 31 months in orbit. Excepting for a brief loss of earth-lock in August 1984 leading to disruption of its services, the satellite has functioned well in all the three segments of telecommunications, meteorology and television and radio networking.

The department of telecommunications has linked 29 fixed and four trans-portable terminals and two fixed terminals of the Oil and Natural Gas Commission (ONGC) with the INSAT-1B.

In the field of meteorology, the satellite has been commanded to give 9,500 images from its inception. The initial set of 100 Disaster Warning (DWS) receivers have been installed in selected spots in coastal areas.

The installation of 100 data collection platforms for collection and transmission of meteorological data has also been completed. More than 473 television stations have been linked to the satellite apart from 93 air stations.

/9317

CSO: 5550/9107

13 May 1986

## INDIA

## LOK SABHA NOTES PROBLEMS OF TELECOM NETWORK

Madras THE HINDU in English 2 Apr 86 p 6

[Text] New Delhi, April 1--Have experts from abroad cautioned India that its telecommunication network is "fast approaching a stage when it will totally collapse because of sheer overload? This question was raised by Mr Prakash V. Patil in the Lok Sabha today.

In reply, the Communications Minister, Mr Ram Niwas Mirdha, said: "Telecommunication services in the country are under severe constraints of scarce resources and overloading of exchanges, due to large waiting lists."

He said this problem was being "duly" taken care of by regular assessment of traffic load at various stages and by adopting "corrective" measures. As such the telecommunication network "will not collapse due to this factor."

## Out of connection

In a written reply to Mr Syed Shahabuddin, the Minister said that MPs among themselves had made 1900 recommendations for telephone connection on out-of-turn priority basis in 1985-86 (up to March 27, 1986). But, the Department could give only 157 connections.

A break-up of the figure shows that of the 157 connections, the Union Territory of Delhi accounted for 62, followed by U.P. 15, Maharashtra 12, and Andhra Pradesh 10. Only one connection each was given in West Bengal, Orissa and Kerala.

## No management experts

Mr Mirdha said there was no proposal to put management experts and other professionals in command of the proposed corporations for Delhi and Bombay telephones separately and giving them a free hand, including in the staff employment.

In written replies, he said no initial changes in the management structure could be considered for some time. It had been decided to treat the present staff of Delhi telephone district as on deputation to the Metropolitan Telephone Corporation without any deputation allowance till the corporation finalises its terms and conditions for employment. The staff would continue to belong to the Department till absorbed in the corporation.

#### Mobile exchanges

The Minister said the Government has imported 25 mobile telephone exchanges with a total capacity of 60,000 lines from the Netherlands.

Of these, 19 have been commissioned in Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Karnataka, Kerala, Manipur, Goa, Punjab, Rajasthan and Tamil Nadu. Six exchanges are being installed.--UNI and PTI

/9317

CSO: 5550/0106

INDIA

SCIENTISTS QUESTION TELECOM TECHNOLOGY TRANSFER

Indigenous Capabilities

New Delhi PATRIOT in English 29 Mar 86 p1

[Article by M.K. Kaul]

[Text]

Contracting of three multinationals of France, Japan and Belgium by the Indian Government for the 'telecommunication technology transfer' has disturbed the Indian scientists who have gained indigenously a major breakthrough in the field.

On Monday next, they say, India's first-ever indigenously designed and developed 'rural telephone exchange' will be put on field trial in a remote village in Karnataka, adding: "there cannot be any better proof of Indian scientists' capabilities".

What has irked them most is the way the Indian bureaucracy has tried and succeeded in frustrating the country's efforts towards self-reliance which has been the cherished goal of the Indian leaders right from the dawn of independence.

Sometime last year, it is said, the Department of Science and Technology, on the demand from the Communications Ministry for "more digital switchgears", invited Indian manufacturers for awarding of licences for the manufacture of digital switches in the country.

It is said around 100 manufacturers put in their applications. But licence was granted to just 18 of them, for, what they were reportedly told, "want of limited demand".

Within a couple of months, to the surprise of the Department of Science and Technology contracted Jumoung

Scneider of France, Hoki of Japan and GDE of Belgium for "technology transfer" for the development of 20,000 digital switches.

It happened at a time when the country's own scientists had been able to develop indigenously telecommunications technology which suited the country most. And what is ironic, it was the Centre for Development of Telematics or C-DOT, as it is commonly known, jointly owned by the Science and Technology Department and Communication Department, that is behind this major breakthrough in the field.

The C-DOT, which is also referred as 'saga of Rs 36 crore in 36 months', is the hand of "young dedicated scientists" who were 18 months ago assigned the job of developing advance telecommunications technology within 36 months with a sum of Rs 36 crore and within the country's industrial infrastructure.

Taking up the challenge against all odds and ridicule from the vested interests in the country and abroad, the C-DOT, in the words of Communications Minister Ram Niwas Mirdha, "has lived up to its expectations" (what he told a press conference last year).

Besides this, the C-DOT, found out that it could do with much less amount than the allotted Rs 36 crore. In its mid-period appraisal of its achievements in February last, the C-DOT came to conclusion that



it could achieve its objective with Rs 25 crore only, notwithstanding the inflation.

It also assumed that of its Rs 20 crore of foreign exchange, it could do with half of this amount.

The main objective before the C-DOT has been to build a family of digital switches in tune with the Indian network and the environmental conditions and as per the prevailing production conditions of the country.

Though the C-DOT's main thrust has been towards the development of bigger 4,000-line digital switches, which can suit the towns of medium proportions and big rural inhabitations, it has, as one of the senior functionaries of the C-DOT explained, produced smaller digital switches as a "byproduct" for the rural areas.

And the one that is to be put on field trial at Kittur village in Karnataka and to be followed by three more at Rajasthan, Haryana and West Bengal

will meet the needs of the rural India where conditions are rugged and sophisticated materials of the advanced countries can not do. The foreign experts too have acknowledged that the C-DOT switches meet the needs of the Indian condition best.

It is modular and can be expanded piecemeal. The basic switch unit, though of 512-line cabinet composed of four 128-line switching module, can be converted into a big unit of 4,000 or so line exchange through interconnecting units. But their similarity all over makes them suitable for almost all fields of telecommunications.

The C-DOT, however, does not keep its technology "close to its breast". It transfers its technology to the Indian manufacturers and also buys their products "to expand their market".

On Thursday itself, some 50 entrepreneurs turned up at its "technology disbursement" programme where it signed 40 of them after they made the initial payment of Rs 1.4 lakh for the technology transfer.

### Indigenous Technology Cost-Effective

New Delhi PATRIOT in English 30 Mar 86 p 1

[Text]

The Centre for Development of Telematics, or C-DOT, has finally shown the way — that there is a demand for indigenous technology in the Indian market provided over-enthusiastic bureaucrats do not become the impediments.

The C-DOT technology, which is 100 per cent Indian and which has been developed within 18 months, is cost effective compared to the foreign technology which a section of the bureaucracy cherishes.

The cost per line of the C-DOT technology is estimated to be at least 25 per cent cheaper than that of the lowest imported technology.

This is a major consideration that is said to have weighed with Indian public sector and private sector enterprises which have opted for the C-DOT tech for the manufacture of PBX technology. And this at a time when the country is already saddled with three imported technologies that the Department of Electronics contracted in the last year for Indian collaborations.

On Thursday last, 36 manufacturers, among whom are the leading lights like the Tatas, Birlas and Indian Telephone Industries, contracted for C-DOT technology "in a single day affair".

There were no long drawn negotiations and haggling or cut backs. Interested parties were asked to make cheques for Rs 1.4 lakh in favour of C-DOT and all the legal formalities were sorted under the same roof within hours. By evening, all the "signed parties" left home with the agreements in their pockets.

"A unique experience, of course", remarked the assembled entrepreneurs and officials.

Initially, when C-DOT, which has been sired jointly by the Department of Telecommunications and the Department of Science and Technology, broached the subject of selling its technology to Indian manufacturers with the authorities in the Union Govern-

ment, it was asked not to contract more than four or five licences for it.

"We fought it ... how could we be the selectors", the C-DOT officials argued. "We won", said Mr S G Pitroda, who is the genius behind C-DOT, at a press conference on Saturday in New Delhi.

The idea behind the "limited licence system" of the Government authorities is based on the "miscalculated" demand for telephones in the country, asserted Mr Pitroda. The Department of Telecommunications has estimated the demand for telephones to be around one lakh a year, while Mr Pitroda estimates it as five times higher.

And he has reason to believe that his estimates are far more realistic than those of the Department of the Telecommunications.

He said while he was in Ahmedabad at the Narmada Valley Fertiliser Corporation recently, he found to his greatest surprise, that there was no telecommunication link between the head office and the units dotting the State.

The various units have to run a courier with dak and other messages from the head office to the units and vice versa. "Can you believe such a thing in 1986?" he asked, in utter disbelief.

The licence holders of the C-DOT technology, added another senior official of the organisation, would not have to go individually to the Government departments for clearance of licence for manufacturing. The C-DOT would be assisting them there too. It would also monitor the progress of its licences during the production period on the monthly basis.

"They can hire the services of the C-DOT technical staff, too", Mr Pitroda said.

/9317

CSO: 5550/0105

INDIA

#### BRIEFS

**RURAL TELECOM EXPANSION**--For the expansion and strengthening of rural telecommunications, the Government has liberalised the policy for opening of small capacity exchanges and long distance public telephone (LDPT). These facilities are being provided under this policy on a subsidised basis, reports PTI. Opening of exchanges and LDPTs would depend on fulfilling the criteria laid down under this policy, according to an official release. The plan allocations for this are met out of the lump sum grant provided to each telecommunication circle. However, about Rs 100 crore for the small capacity exchanges are provided. In the seventh Five-Year Plan approximately 1.80 lakh of lines and 2000 long distance public telephones are proposed to be provided, subject to availability of the demand and equipment. [Excerpt] [New Delhi PATRIOT in English 6 Apr 86 p 5] /9317

**SATELLITE EARTH STATIONS**--Port Blair, April 5 (PTI)--Three more satellite earth stations will be set up in the Andaman and Nicobar islands by 1986-87 in addition to the existing ones at Port Blair and Carnicobar, according to Mr Monoranjan Bhakta, MP. Mr Bhakta told reporters here today that he had received an information to this effect from Union Minister of State for Communication R.N. Mirdha. [Text] [New Delhi PATRIOT in English 6 Apr 86 p 5] /9317

CSO: 5550/0108

MALAWI

FRENCH COMPANY SECURES TELECOMMUNICATION, MICROWAVE CONTRACT

Paris AFRICAN DEFENCE JOURNAL in English Apr 86 p 35

[Text]

• Malawi chooses TRT to establish a major part of its microwave radio and rural telephony network. The French company TRT has been commissioned by the Malawi post office for the turnkey provision of a significant part of the microwave radio links and many of the rural telephony links in isolated areas of the country.

The Malawi post office, Sofrecom and TRT have worked closely in defining the design and construction details for these links.

The orders received, amounting to 52 million francs, cover equipment for the southern part of the country around the towns of Thyolo and Blantyre, and for the northern part around Mzimba during a first phase, and between Mzu-Mzu, Karonga and Chitupa during a subsequent phase.

These networks represent 30 sta-

tions consisting of TRT's new-generation digital microwave radio system and its well-known IRT-1 500 rural telephony system. They include transmitter-receivers of the TRT NFH-7 500 and DRL-1 502 type which, associated with TRT's TMN-162 differential transcoder, make it possible to double the number of telephone channels transmitted. Most of the repeater stations are solar-powered.

TRT is also training Malawi post office personnel so that they can actively participate in the completion of the project. The networks of Thyolo (southern region) and Mzimba went into service in December 1985. Those of the northern region (phase 2) are to go into service by the end of 1986. The entire project will be operational early in 1987.

/12851  
CSO: 5500/62

## EUROPEAN AFFAIRS

## MANEUVERING IN EUROPEAN TELECOMMUNICATIONS

Milan L'ELETTRONICA in Italian No 23, Jan 86 pp 14, 15

[Article by Giuseppe Caravita: "Telecommunications: A European Supergroup"]

[Text] The greatest strategic plan in the history of European telecommunications is taking shape. Jetliners flying between Britain, France, and Italy are swarming with managers and engineers of this sector who engage in often feverish consultations and in analyses of proposals and counterproposals. Everybody knows the general terms of the issue. Britain, with its British Telecom-designed X system currently being produced by GEC and Plessey, as well as France with its E 10 and Italy with its UT range all face the same problem: too little market with respect to the development and design costs which currently outstrip the profit-making possibilities that a single national market provides.

There is no way out; there are no alternatives except to capture a substantial share of the U.S. market, in an "open" sector brought about by the U.S. deregulation. But, on the other hand, the costs of converting station Cept standards to the Bell system have so far hindered such interesting prospects from becoming a reality. In fact, this problem is a real trade barrier which only the Japanese industrial group NTT-NEC-Hitachi-Okai, as well as Siemens and ITT, and, to a certain extent, Ericsson, have overcome.

But Europe is also fighting for brighter prospects. Since, on a strictly technological level, its telecommunications systems match the most advanced AT&T stations and outdo the Japanese systems, Europe has placed its money on Race in order to achieve first place in the world for products such as wideband transmission networks, integrated systems capable of handling high resolution images, and "intelligent" software operating on fiber optics networks. But how can Europe attain this goal in a situation in which 60 percent of the European telecommunications industry has R&D costs which total twice its major competitors for every station line sold, even though these competitors are less culturally advanced?

The "supergroup" project stems from such a situation. It is based on a trilateral agreement on the opening of markets, technologies and exports. As an immediate result the common opening of the markets will allow competition to increase in the European marketplace. Inevitably, a reorganization

process involving a worldwide sector will imply some sacrifice for some company. But the core of the information technologies is also directly involved in this situation, so it will also create new business opportunities and the opening of "niches" for further advances. This provides the possible solution to the complex situation that so far has prevented resources and productions from being reallocated in Europe. In other words, an Ericsson or ITT branch can be asked to reduce its domestic market share as far as switching exchanges are concerned if European-wide business "niches" for advances in several product lines can be guaranteed. At the same time, a European market could provide a sufficient base on which important projects clearing the way to technical advances (suitable for export), such as wideband networks, would grow and gain strength.

So far, so good. In the same way there is a commitment to launch a European standard, that is, technical regulations aimed at preventing the wasteful extra design costs (30 percent) in order to allow the systems to meet the current EEC member states regulations.

In this way, the feasibility of the proposals which have been put forward in the Eureka program (a wide-ranging plan concerning next generation switching exchanges which Italtel, Cit-Alcatel, and Plessey are developing) surely would be increased. Moreover, on the basis of the existing program, the positive start of the four-sided Italtel-Siemens-Alcatel-Plessey agreement on key switching components is spurring high hopes for real options, and for the potential involvement in the "European club" of the multinational company Siemens, which today is too large an elephant to abruptly board the unstable and unfinished boat of the European agreement.

But this is not the issue worthy of careful consideration. The key feature is that the French would like to add an agreement with the AT&T giant for a "market share exchange" with the "Europole."

This is what it is about: As early as several months ago the top-level management of the French CGE put forward a proposal to Mitterand's government for a trade agreement with AT&T which envisaged a U.S. market outlet for French communications products (an AT&T captive market), against an equivalent volume of ESS5 supplies to DGT France. At that time the proposal was rejected for obvious political reasons. Today such a program (which at present is under negotiation) can be proposed as an exchange with the European pole in order to resurrect the troubled Philips-AT&T joint venture based on ESS5.

The consequences of this move in the worldwide theater of information technology strategies could easily be foreseen. Another important player, the "queen" of the opposing field (data-processing) immediately took action. IBM's management is aware that the conclusion of this agreement is likely to result--nothing more, nothing less--in a strategic encirclement of IBM itself in Europe. This encirclement would be carried out by an opposing coalition under the supervision of AT&T, ranging from Philips of the Netherlands to Olivetti, with as many as five key industrial groups being merged in a cooperative venture, including at least two powerful PTT's. It

would be virtually the end of IBM's ambitions to capture at least 40 percent of the \$10 million market for new telematics services that is foreseen in Europe within 5 years.

This is why IBM is now raising its voice. Mr Kasper Kassani (who is a friendly and intelligent man) today is forced to shift his policy from the "Europe-bond" promises--which date from a few months ago at the time of the OSI opening and the outburst of enthusiasm for Esprit--to the threat of a deep "deregulation" in Europe. He must also take on the challenge of major customers (a field reserved to IBM) who refuse volume charges for data network utilization, dreaming instead of IBM satellites at a rate of \$1.00 per transmitted gigabit.

That is why IBM adopted a unusually hard attitude during a meeting held on IEFE's premises at Bocconi University. IBM Italia has put forward a proposal to STET [Telephone Finance Corporation], to set up a telematics network, which IBM itself has designed and implemented, and which is capable of meeting the communication requirements of major customers according to architectures featuring high transmission rates and cheaper costs per bit than the Itapac network. Obviously, it is a network which is based on the SNA [Systems Network Architecture] architecture which recently opened in the OSI [Office of Scientific Information] standard.

Moreover, IBM Italia has conceived a proposal for an economic compensation to the Italian public network managers for the traffic coming from the already operating facilities which is routed to this network.

What is explained above are the general terms of the negotiations which are under way at present.

But besides the "high strategy" reasons that have been assumed above, the IBM Italia proposals are supposed to be a direct consequence related to the takeoff of programs such as Seva of Olivetti, Telveas of Montedison in addition to the leading place that Geisco has achieved in the fast-developing field of value-added telematics services. In conclusion, IBM has been trying unsuccessfully for about 5 years to reach operational agreements with the PTT (see the British example dating back to October 1984 when its agreement with British Telecom for the implementation of an IBM-made VAN [Value Added Network] network was blocked by the government), but today is outdistanced by fast-moving and more versatile European companies. This probably is the real reason which allowed the ticklish negotiation to be resumed. But Italy is only a piece of an international jigsaw puzzle.

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CSO: 5500/M2606



FEDERAL REPUBLIC OF GERMANY

FRG BUNDESPOST PLANS EXPANSION OF 'BIGFON' NETWORK

Munich FUNKSCHAU TELEKOMMUNIKATION in German No 5, Feb 86 pp 36-39

[Article by Herbert Noll: "Bundespost Wideband Networks: Glass Times"; first paragraph is FUNKSCHAU TELEKOMMUNIKATION introduction]

[Text] At the end of this year, transmission of the full text of the Bible from Hamburg to Munich in 1 second will no longer present any problem. For by that time at the latest the fiber optic long-distance circuit interconnecting the individual BIGFON islands is expected to be ready. Each cable of the approximately 1,000-kilometer "long-distance glass" will reportedly handle up to 565 Mbits per second.

"New technology revolutionizes telecommunications" is the yellow-on-black wording in an information pamphlet issued by the German Bundespost regarding fiber optics and the experimental BIGFON system [Wideband Integrated Fiber Optics Long-Distance Telephone Network]. This 1983 brochure euphorically states: "For us the 20th century is already yesterday." In the meantime, the euphoria has abated somewhat and everyday procedures have turned to fiber optics as well. What remains is a technology capable of transmitting every single service offered by the Bundespost, ranging all the way from telephone conversations through data and text traffic to video conferences, via a bundle of optical fibers.

There Are Seven BIGFON Networks in Germany

At present, the Bundespost operates seven of these so-called "BIGFON-island networks," each serving 30 to 50 "fiber optic subscribers." These mini-networks exist in various large cities where diverse companies have responsibility for installation and maintenance of individual systems:

- Berlin: Krone, SEL [Standard Elektrik Lorenz], Siemens
- Hamburg: PKI
- Hanover: ANT, FUBA
- Dusseldorf: ANT
- Stuttgart: SEL
- Nuremberg: PKI
- Munich: Siemens



Bundespost specifications defining the technical capacity of BIGFON test installations refer to the simultaneous transmission of:

- at least 2 digital telephone, data, and text channels;
- 2 to 4 switched TV channels or, alternatively, 2 x 6 dedicated parallel TV channels;
- 4 switched or 24 single dedicated stereo broadcast channels;
- 1 video telephone channel [bidirectional] with color TV quality.

The aforementioned companies are also to manufacture the technical hardware such as exchanges, optical fibers and copper/glass interfaces.

#### Trunk Line From Hamburg to Nuremberg

The installations have been operating for 1 year and all systems work satisfactorily, according to the Bundespost; even the failure rate of the installations is said to be within limits. Before the end of this year, the Bundespost wants to connect the BIGFON-islands with a fiber optic long-distance line in order to test "fast" Bundespost services between distant locations. This long-distance line crisscrosses Germany from Hamburg via Hanover to Berlin and from Hanover through the Rhine, Main, and Ruhr areas and Stuttgart down to Munich in the south. From there it goes back north, toward Regensburg and Nuremberg.

At this time cable installation teams are already working on an interconnect cable between the metropolitan areas of Swabia and Bavaria, "digging in" a type of optical fiber capable of transmitting 565 MEPS per strand. This so-called "monomode fiber" can handle up to 7,680 telephone conversations or 4 channels for video conferences or video telephones simultaneously, using a light transmitting core of only 8 micron diameter. This data capacity can only be reached because at short wavelengths [around 1.3 microns] the modulated laser light spreads in predominately linear form inside the fiber. There is hardly any delay differential between the light reflected from the perimeter of the fiber and the light propagating linearly inside the fiber. Because of the high bit rates thus achievable, the Bundespost could both reduce the number of strands per cable to 24 and increase the possible distance between signal processing "repeaters" to 32 km, in contrast with cables used up to now. In the laboratory, engineers are already bridging distances of up to 100 km using this technology, without the need for intermediate regeneration.

#### Gradient Fiber Up to Karlsruhe

This is different from the previously installed "gradient fiber," which requires a repeater to "recondition" bits every 18 km from Hamburg to Karlsruhe; 60 hairlike, ultra-thin glass strands are required for monomode data capacity. This is because in the gradient profile light propagates at different speeds depending on whether it is continuously reflected within the cable or "shines" straight through the center core. The effect is somewhat reduced by a trick: The core, which is 50 microns thick, is made of glass

with different refraction indices [stronger from the inside to the outside]. However, light pulses arrive with delays of up to 1 nanosecond per kilometer.

Nevertheless, gradient technology is capable of transmitting an additional 140 MBPS per strand, sufficient for one video channel or approximately 2,000 telephone channels. Such a transmission capacity would never be fully used in the BISFON tests. However, this approximately 1,000 km test cable has not been installed only for this test. The cable must also:

- increase the number of north-south telephone channels;
- be the main trunk for a nationwide video conference test network;
- form the basis for a universal fiber optic network with which the Bundespost intends to integrate all narrow and wideband services.

#### The Pipe Is Already Too Narrow

However, the "pipe" would already be much too "narrow" for that many tasks. But, as it is currently doing almost everywhere in the FRG, the Bundespost is burying at least empty pipes parallel to this long-distance cable, in which fiber optic cables can be inserted on short notice without high cost. Since 1984 the Bundespost has been adding a "spider web" of optical fibers to its underground copper cables. Installers take every opportunity during excavation and cable-laying operations to bury an equal length of optical fibers.

This standby cable system is called an "overlay network" and it will not be long before this "dormant" wideband network goes into operation. By 1992, the network should be completed. In 1986, 14 more local networks are to be equipped with these cables, i.e., Hamburg, Bremen, Berlin, Hanover, Dortmund, Essen, Düsseldorf, Cologne, Bonn, Frankfurt, Mannheim, Nuremberg, Stuttgart, and Munich.

In 1987, an additional 15 will be added in each of the larger metropolitan areas of each federal state.

In total, about 100 local networks must be equipped with wideband cable by 1992 in order to provide access for about 1,000 potential video conference subscribers. By the middle of next year, the Bundespost wants to have 150 video conference rooms wired into its broadband network, although not exclusively by optical fiber. Where the optical fiber network is not yet ready, the existing 2 MBPS coaxial cable network must suffice. This bit rate is sufficient for video transmission, but far from the color television quality we are used to. In extreme cases the whole picture may occasionally fail. This sort of problem does not exist in 140 MBPS technology.

For international video conference traffic, 7 MBPS generally should be sufficient, especially on overseas satellite links. So far, only West Germany has opted for the expensive but high quality 140 MBPS per video channel.

But even with advanced technology the Bundespost must advertise heavily to sell its broadband services. This is done through the operation of public teleconference rooms in 12 West German cities for "demonstrations." Here,

prospective subscribers "can get acquainted with this new conferencing format." Like the BIGFON islands, these video conference rooms are spread throughout the FRG and West Berlin. However, not all are connected via optical fiber. International connections are possible.

#### Video Conferences Instead of Trips

The Bundespost sees the advantage of video conferences not only in avoiding costly and time-consuming trips and in simpler and quicker transfer of information, but also in the possibility of immediate exchange of supporting documents for joint work. Both technical and intracompany developments can thus be coordinated over many kilometers in a time-saving manner.

It is a good idea if, parallel to the video systems, equipment for information accompanying graphics, such as Telefax, word processing, and devices for the inclusion of hard graphics and other video materials are also available.

Such a long-distance conversation with eye contact is hardly inexpensive. In addition to investments for the conference room and its technical equipment as well as the one-time and monthly connection fees, there are also charges for actually carrying out such conversations to balance against the travel expense savings. (The current rate schedule is printed on page 37.) The subscriber must pay extra for additional postal services used, such as BTX, Telefax, or text transmission.

In spite of these costs, the Bundespost states that there are already more clients wanting connections than are currently possible. Nevertheless, it will probably not be until the 21st century that the "Telecommunications Revolution" is accomplished, not in the least because of the prices.

#### Summary

"The trunk lines of the future telecommunications network of the FRG Bundespost are already crisscrossing all of Germany. This year all of the BIGFON broadband islands are to be connected to that optical fiber network in which, among other things, picturephone communication is possible. A test network for video conferencing is likewise using this optical fiber layout. The Bundespost is counting on approximately 1,000 subscribers to these broadband services by 1992."

## Subscriber Rates for the Video Conferencing Trial Operation

For connection of private video conference rooms to the video conference trial network and for processing of video conferences the following rates are charged:

### 1. Connection rates

- |             |           |
|-------------|-----------|
| a) one time | DM 12,000 |
| b) monthly  | DM 1,500  |

### 2. Operating rates\*

- |   |            |
|---|------------|
| a) nationally for the total connection per hour               | DM 800     |
| b) within Europe for the German portion (half link) per hour  | DM 1,200** |
| c) outside Europe for the German portion (half link) per hour | DM 2,500** |

### 3. Reservation rates\*\*\*

(operating rates as per 2)

- |                   |          |
|-------------------|----------|
| a) national       | DM 400   |
| b) within Europe  | DM 600   |
| c) outside Europe | DM 1,200 |

### 4. Other rates

- |   |            |
|---|------------|
| a) Surcharge for connections abroad as described under 2b and 2c beyond the transmission time agreed upon with the other administration per hour: | DM 150     |
| b) Fee for the use of public video conference rooms in addition to the actual conference per hour:  | DM 120**** |

\* Calculated for national video conferences per beginning 1/4 hour unit and for international connections per beginning 1/2 hour unit. Minimum duration 1/2 hour (less reservation fee).

\*\* The operating fee is charged to the German participant. The other administration charges accordingly in its area.

\*\*\* Even for reservations by the foreign subscriber the desired connection must be confirmed in writing with the Bundespost by the German participant.

\*\*\*\* Not for demonstrations or trial conferences.

8617/5915

CSO: 5500/2607-M

FRANCE

#### BRIEFS

AEROSPATIALE BUILDING SATELLITES--The consortium led by Aerospatiale has been chosen by the organization for satellite telecommunications, Eutelsat, to supply its next three satellites with an option for five more. Aerospatiale obtained the Fr 1.5 billion contract after tough competition with another consortium led by Matra, which has already supplied the first four ECS's [European Communication Satellites]. As the prime contractor for these second-generation satellites, Aerospatiale is associated with Alcatel-Espace and with five other European companies: Marconi (UK), MBB [Messerschmitt-Bolkow-Blohm]-ERNO [Northern Development Area] (FRG), Aeritalia (Italy), Ericsson (Sweden), and ETCA [Space Technology and Construction Studies] (Belgium). The first launch, by either Ariane or the shuttle, will take place in 1989. [Text] [Paris L'USINE NOUVELLE in French 24 Apr 86 p 43] 25004

/9716

CSO: 3698/A127

ICELAND

GOVERNMENT ACQUISITION OF EARTH STATION LOWERS PHONE COSTS

Reykjavik NEWS FROM ICELAND in English Apr 86 p 6

[Text]

The cost of owning and using a telephone in Iceland is lower than in any other country in Western Europe or the USA. It is possible that the cost of phoning abroad will come down in the future, since control of Skyggnir, Iceland's earth station for satellite communications, has now passed completely into the hands of the Post and Telecommunications Administration.

A cost survey by the engineering firm Siemens at the beginning of 1985, based on annual telephone rent, one-tenth of installation cost and charges for 700 local calls and 200 long-distance calls, put Iceland at the bottom of the cost ladder at DM363 (about \$140). Luxem-

bourg came next at DM387, Sweden at DM426, and the highest European rate was in Norway, DM1,280.

Subsequently, in July 1985, further reductions were made in the Post and Telecommunications Administration's rates. The cost of installing a telephone fell by nearly 8%, and that of installing a telex machine by 45%. The quarterly rate for a telex machine dropped by 74%.

At the beginning of this year, the administration's agreement with the Scandinavian company, Det Store Nordiske Telegraf-selskab, ran out, ending 25 years of collaboration in the field of international communications.

Iceland continues to rent the use

of the undersea Scotice line, which is owned by the Scandinavian company, as a standby line in case of emergency.

New post and telecommunications charges took effect as from February 1. Postal charges rose by an average of 25-30%, making the basic rate for letters inland and to Scandinavia 25 cents, and about 31 cents to other European countries. Telephone rates between Iceland and the USA and Canada dropped by 15%, and telex charges to those countries came down by 32% and 50% respectively.

A spokesman for the Post and Telecommunications Administration said that it was not likely that there would be any further reductions in the scale of charges this year, because of unexpected claims by the Treasury and the cost of taking over Skyggnir. On the other hand, this year will see the completion of automation in the telephone system in Iceland, making automatic long-distance and international calling possible from anywhere in the country.

/9274  
CSO: 5500/2651

ITALY

BRIEFS

VIDEOTEL FOR INDUSTRY--The industrialists association in Florence started the first Italian Videotel network designed for industry on 25 November. There are already dozens of subscribers who, for 50,000 lire per month, can immediately have at their disposal all useful information on industrial activities. Furthermore, a closed system for users, which will receive information from the association, has been created. Also taking part in the initiative is the Banca Toscana, with a service via satellite from the United States to publicize the commercial opportunities of over 100 countries. Through the bank, it is thus possible to obtain orders for products and services, representation of firms and licences, etc., from manufacturers and foreign importers, agents and distributors. [Text] [Milan VIDICON in Italian No 1, Dec 85/Jan 86 p 54] 8603/8918

OPTICAL FIBERS IN LOMBARDY--The municipality of Milan and the Lombardy region in mid-December signed an agreement to start an optical fibers network project in large Lombard urban areas. The contract, which was signed by Cavi Pirelli, Italtel, Sip and Sirti, foresees by the end of the 1980's a telecommunications network for the transmission of different types of information, such as voice data and images. It will also provide telematic services to professional and individual users. [Text] [Milan VIDICON in Italian No 1, Dec 85/Jan 86 p 54] 8603/8918

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